Outbreaks, Nosocomial
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Definitions

Nosocomial Outbreak Definition
Nosocomial infection outbreaks are infections that occur in excess of, generally 2 times, the normal expectancy in patients/residents of a health care institution. It can also be a significant ($P<0.05$) increase in the rate of infections above the facility's background rate. [1,2]

Nosocomial infections are distinguished from community-acquired infections by the following criteria:

1. The infection is not present or incubating (generally, greater than 48 hours) at the time of admission and is not an extension of an infection process present at the time of admission. [1,2]
2. The infection manifests itself after discharge within a defined period of time (i.e.: for surgical site infections, 30 days unless an implant is present, then up to 1 year). Re-admission may or may not be required. [2]
3. When a mother free of infection upon admission delivers an infected (not transmitted transplacentally) infant 48 to 72 hours later. [2]

The Centers for Disease Control and Prevention's (CDC's) definitions of nosocomial infections can be found in Subsection 31.1 Appendix A.

Information Needed for Investigation[2,3]

1. Verify the diagnosis
   Check laboratory tests, X-ray, etc.

2. Request help
   Contact the District Communicable Disease Coordinator or the Section of Communicable Disease Control and Veterinary Public Health (573-751-6113 or 800-392-0272) for assistance with outbreak investigation as soon as an outbreak is suspected. The causative organism determines specific prevention and/or control strategies.

3. Develop a case definition
   A preliminary definition can be derived from the affected persons' signs and symptoms, the etiologic agent, or both. The definition must include person, place and time. (Example: All persons in facility or unit having a surgical site infected with MRSA within the past 90 days.)

4. Initiate more thorough surveillance (check for additional cases)
   The first recognized cases in a nosocomial outbreak might only be the most obvious. Many unrecognized definite or probable cases will be uncovered when observations of signs and symptoms, including documentation, become more deliberate and systematic. Using a list of all probable symptoms that might be associated with the illness and the organism (if known) causing the first cases, identify other infected cases in the facility beginning with the nursing units where the first cases occurred. (See Sample Line list, Subsection 31.2).

   Identification of other infected cases involves both clinical observations and chart review. (See Sample Outbreak Medical Record Review Form, Subsection 31.3)

   Critical information needed to analyze how and when the organism was transmitted include: age, sex, time and date of disease onset, duration of and sequence of symptoms, resident's room and nursing unit, and possible means of exposure (roommate, dining room table mates, activities, degree of debilitation, treatments, invasive devices, other).

   Employees may also become infected and consequently need to be included as cases. (See Employee Questionnaire Related to Outbreak, Subsection 31.4)

5. Verify that an outbreak exists
   Calculate rates and verify that the current rate is above background rate(s). The number of cases reported now should be greater than the number reported during previous comparable periods.

6. Describe the demographics
   a. Invasive procedures
   b. Surgical risk factors
   c. Underlying disease
   d. Culture results and antibiogram similarities (request the lab doing the testing related to the outbreak to save all specimens until further notice)

7. Formulate a tentative hypothesis (explanation) of the etiologic agent, the source of the infection, and the mode of transmission.

8. Conduct a literature search for:
   a. Reservoirs of the disease-producing organisms
   b. Modes of transmission
   c. Risk factors identified in other outbreaks

9. Implement preliminary control measures as indicated:
   - Enforce frequent and adequate handwashing.

- Use gloves and other personal protective equipment as indicated.
- Implement airborne precautions if indicated.
- Restrict activities if appropriate.
- Keep persons with respiratory illness in their rooms.
- Cohort ill persons and staff that will be responsible for their care. Place similarly infected persons together (same room or wing) if possible. Designate staff to care for the infected/colonized persons separate from those staff caring for persons not ill or infected with the outbreak disease/organism.
- Change dressings often to assure that drainage is contained.
- Employees with a contagious disease should not be allowed to work.
- Provide fact sheet handouts or educational offerings on the organism and control measures to all who need to know.

10. Analyze data - epidemic curve, infected sites graph, rates, etc.

11. Determine causative mechanisms for the outbreak (formulate conclusions)

12. Design and implement intervention control measures that will eliminate the reservoir and/or prevent further transmission.

13. At the conclusion of the outbreak, submit the final outbreak report.
(See Outbreak Report Form, Subsection 31.5) Include number of symptomatic versus total number exposed in both the patient/resident and employee populations, as appropriate. Include copy of linelist.

Reporting Requirement

Nosocomial outbreaks are a Category II disease and shall be reported to the local health authority or to the Missouri Department of Health and Senior Services (DHSS) within 3 days of first knowledge or suspicion by telephone, facsimile or other rapid communication.

By reporting an increase in illness or infection early, assistance can be received in identifying the causative organism (testing performed by the State Public Health Lab), the source of the organism, and probable mode of transmission. Reviewing appropriate barrier and isolation precautions for implementation can prevent expansion of the outbreak and/or the occurrence of serious health outcomes.

1. All outbreaks or "suspected" outbreaks must be reported as soon as possible (by phone, fax or e-mail) to the District Communicable Disease Coordinator. This can be accomplished by completing the Missouri Nosocomial Outbreak Report Form (Mo 580-1598) rev (2-99).
2. Within 90 days from the conclusion of an outbreak, submit the final outbreak summary to the District Communicable Disease Coordinator.

References

1. Mayhall, C. Glenn. Hospital Epidemiology and Infection Control. 1996. Williams & Wilkins, Baltimore, MD: 106, 1018.
2. Wenzel, Richard P. Prevention and Control of Nosocomial Infections. 3rd ed. 1997, Williams & Wilkins, Baltimore, MD: 175-213.
3. Missouri Department of Health, Division of Environmental Health and Communicable Disease Control, Principles of Epidemiology Manual, 1997.

INFECTION CONTROL LINE LISTING

UNIT_____DATE_____EPIDEMIOLOGIST/NURSE_____

ID#	NAME	AGE	SEX	RM.	INFECTION SITE						LAB DATE	DATE SX	RX DATE	PREDISPOSING FACTORS
					SURG	RESP	UTI	GI	SEPS	OTH				
TOTALS														

Figure 7.1-4

Generic Outbreak Medical Record Review Form

Demographic Data

Epi No. _____ Record No. _____ Reviewer _____

Resident Name _____ Review Date _____

Status _____ (1=case 2=uncolonized 3=colonized control 4=matched uncolonized control 5=matched colonized control)

Set number _____ (to correlate case with controls)

Race _____ Age _____ DOB _____ Sex M / F
(1=white, 2=black, 3=Ameriocan Indian/American Native, 4=Asian/Pacific Islander, 9=Not specified)

Facility _____ (H or NH)

Transferred From _____ (Name of Facility) _____ (Date)

Transferred To _____ (Name of Facility) _____ (Date)

Outcome _____ Date _____
(1-recovered, 2-recovered colonized, 3-recovered decolonized, 4-not recovered, 5-death, 6-discharged unknown)

	Unit	Room	Date
Admission	____	_____	_____
Transfers	____	_____	_____
	____	_____	_____
	____	_____	_____

Infection Type	Onset Date	Infection Type	Onset Date	Infection Type	Onset Date
Abscess site _____	_____	Ear extern/media/intern	_____	Tracheobronchitis	_____
Central venous line (CVL)	_____	Eye infection	_____	Pneumonia/pneumonitis	_____
I.V. site/vein	_____	Colitis, antibiotic associated	_____	Osteomyelitis/joint/bursa	_____
Cellulitis/fasciitis	_____	Enterocolitis, necrotizing	_____	Intraabdominal/peritonitis	_____
Bloodstream, primary	_____	Gastroenteritis	_____	Reproductive tract, _____	_____
Bloodstream, secondary	_____	Hepatitis, type _____	_____	Surgical wound, incisional	_____
Endo/myo/pericarditis	_____	Gastrostomy site	_____	Surgical wound, deep	_____
Encephalitis/sub/epidural	_____	Tracheostomy site	_____	Cystitis	_____
Meningitis/ventriculitis	_____	Mouth/tongue/gums	_____	Pyelonephritis	_____
Sepsis, clinical	_____	Pharyngitis/laryngitis	_____		
Gram negative shock	_____	Sinusitis/nasal/URI	_____		
Gram positive shock	_____	Bronchitis/bronchiolitis	_____		

Clinical Finding	Onset Date	Clinical Finding	Onset Date	Clinical Finding	Onset Date and/or Value
Atonic	_____	Dysphagia/sore throat	_____	Skin warmth	_____
Confusion	_____	Dyspnea	_____	Swelling	_____
Headache	_____	Tachypnea	_____	Macules	_____
Hypertonic	_____	Grunting	_____	Papules	_____
Hypotonic	_____	Lung infiltrate	_____	Petechiae	_____
Irritability	_____	Nasal flaring	_____	Pustules/boils	_____
Lethargy	_____	Rales/rhonchi	_____	Pruritus	_____
Nuchal rigidity	_____	Retractions	_____	Urticaria	_____
Malaise	_____	Sputa purulent	_____	Vesicles	_____
Myalgia	_____	Wheezing	_____	Dysuria	_____
Seizures	_____	Chills/rigors	_____	Frequency/urgency	_____
Syncope	_____	Hyperthermia	_____	Temperature	_____
Abdominal cramping	_____	Hypothermia	_____	Pulse	_____
Abdominal distention	_____	Temp. instability	_____	Respirations	_____
Anorexia/poor feeding	_____	Asystole	_____	B/P	_____
Diarrhea	_____	Bradycardia	_____	O_2 Sat.	_____
Hepatomegaly	_____	Tachycardia	_____	PCO_2	_____
Nausea	_____	Hypertension	_____	Acid/Base	_____
Splenomegaly	_____	Hypotension	_____	pH blood	_____

Vomiting	_____	Drainage, purulent	_____	APGAR (1 & 5 min)	_____
Apnea	_____	Drainage, serous	_____	Meconium stained	_____
Coryza/stuffy nose	_____	Desquamation	_____	FHT’s	_____
Coughing	_____	Erythema	_____	Decels	_____
Cyanosis	_____	Pain/tenderness	_____	Full fontanel	_____

Treatments, Date Initiated, Healthcare Worker (HCW)

	Date	HCW	HCW	HCW	HCW	HCW	HCW
Catheter insertion							
Central venous line (CVL)							
Intravenous, peripheral							
Other vascular							
Enteral feeding							
Nasogastric							
Urinary							
Dialysis							
Hydrotherapy/whirlpool							
Physical therapy (specify)							
Respiratory therapy (specify)							
Intubation, endotracheal							
IPPB							
O_2 cannula							
Ventilation, assisted							
Tracheostomy							
Suction							
Bulb, DeLee							
Nasotracheal							
Oropharyngeal							
Tracheostomal							
Other							
Wound manipulation							
Cleansing							
Debridement, manual							
Irrigation							
Suctioning							

Medications

	Drug Name & Dosage	Start Date	Stop Date	# of Days
Analgesia				
Antibiotics				
Chemotherapy				
Corticosteroids				
Immunosuppressants				

Vaccine				
Immunoglobulin				
Amantadine				

Serology

WBC _____ Absolute Neutrophils _____ Segs _____ Bands _____

Hbg. _____ Hct. _____

Chemistry

Serum glucose _____ Serum total protein _____ Bilirubin _____

Urine

Colony count _____ WBC's _____ RBC's _____

Gram Stain _____ or **Other Stain** _____

Feces

Hemoccult _____ WBC's _____

Toxin assay _____ Positive _____ Negative _____

Source and Specimen Collection Dates of Isolates and/or Antigens

Sterile Site	Isolate/Antigen	Date	Sterile Site	Isolate/Antigen	Date
1. Blood	_____	_____	5. Synovial fluid	_____	_____
2. CSF	_____	_____	6. Tissue	_____	_____
3. Peritoneal fluid	_____	_____	7. Other	_____	_____
4. Pleural fluid	_____	_____			

Non-Sterile Site	Isolate/Antigen	Date	Non-Sterile Site	Isolate/Antigen	Date
1. Ear	_____	_____	10. Invasive Site	_____	_____
2. Eye	_____	_____	11. Skin	_____	_____
3. Bronchi	_____	_____	12. Surgical wound	_____	_____
4. Lungs	_____	_____	13. Rectum/feces	_____	_____
5. Nose	_____	_____	14. Stomach	_____	_____
6. Throat	_____	_____	15. Urine-bladder	_____	_____
7. Trachea	_____	_____	16. Umbilical cord	_____	_____
8. Sputa, expectorated	_____	_____	17. Vagina	_____	_____
9. Decubitus	_____	_____	18. Other	_____	_____

Underlying Conditions or Infections Leading to Current Infection

1. Alertness, reduced	_____	13. Dialysis	_____
2. Anemia or sickle cell	_____	14. Hemorrhage	_____
3. Alcohol abuse	_____	15. HIV/AIDS	_____
4. Alzheimers or dementia	_____	16. Incontinent: urine/feces	_____
5. Burns (severity: _____)	_____	17. I.V. drug abuse	_____
6. Cerebral vascular accident	_____	18. Malignancy	_____
7. Chronic heart disease	_____	19. Malnutrition	_____
8. Chronic lung disease	_____	20. Pelvic inflammatory disease	_____
9. Chronic renal disease	_____	21. Peripheral vascular disease/ulcer	_____
10. Cirrhosis/liver disease	_____	22. Pressure sore	_____
11. Debilitation	_____	23. Splenectomy	_____
12. Diabetes mellitus	_____	24. Other	_____

Personal Care

Feeding ___ [E]ats unassisted [F]ed by mouth [T]ube fed

Bathing ___ [B]ed bath [S]hower [T]ub bath

Mobility ___ a[M]bulatory a[S]sisted [B]edfast [W]heelchair

Beauty shop/barber (yes/no) ___

Activities yes/no

Crafts _____ Games _____ Exercises _____ Singing _____ Socializes _____ Other _____

Figure 7.1-6

Employee Questionnaire Related to Outbreak

Name: _____ Age: _____ Sex: _____

Department: _____ Shift hours: _____

Assigned areas: _____ Duties: _____

Personal Care: Yes/No Interviewing: Yes/No Give medications: Yes/No

OR/ER Surgical Asst: Yes/No OR/ER Circulator: Yes/No Provide treatments: Yes/No

Have you had any of the following conditions recently?

	Yes/No	Date Started	Comment
Skin irritation or rash	_____	_____	_____
Skin wound, sore, blisters or pimples	_____	_____	_____
Nasal or sinus drainage	_____	_____	_____
Throat drainage or soreness	_____	_____	_____
Cough	_____	_____	_____
Coughing up drainage from the chest	_____	_____	_____
Eye drainage	_____	_____	_____
Ear drainage or pain	_____	_____	_____
Vaginal drainage	_____	_____	_____
Nausea and/or vomiting	_____	_____	_____
Diarrhea	_____	_____	_____
Frequent urination/pain when urinating	_____	_____	_____

Has anyone in your family had the same conditions as you? _____Yes _____No

Has anyone in your household had an infection in the past month? _____

Have you or has your family seen a doctor for this? _____Yes _____No

Name of doctor and diagnosis: _____

_____

What type of medication have you used? _____

What date or week did you last use the medication? _____

The medication caused the condition to: improve/get worse (circle correct answer)

Did condition return after medication was discontinued? _____Yes _____No

Thank you for your time and cooperation in answering these questions.

MISSOURI DEPARTMENT OF HEALTH
SECTION OF COMMUNICABLE DISEASE CONTROL AND
VETERINARY PUBLIC HEALTH

NOSOCOMIAL OUTBREAK REPORT FORM

PO BOX 570
JEFFERSON CITY , MO 65102
(800)392-0272 OR
(573/751-6113

REPORTED INITIALLY BY

NAME	TITLE	
ORGANIZATION	DATE/TIME	TELEPHONE NUMBER
TO NAME	TITLE	
ORGANIZATION	DATE/TIME	TELEPHONE NUMBER

REPORTED TO

LOCAL CO/CITY HEALTH DEPT. ☐ Yes ☐ No DATE _____ TIME _____
DISTRICT HEALTH DEPT. ☐ Yes ☐ No DATE _____ TIME _____
COMMUNICABLE DISEASE ☐ Yes ☐ No DATE _____ TIME _____
DIVISION OF AGING ☐ Yes ☐ No DATE _____ TIME _____

DEPT. OF MENTAL HEALTH ☐ Yes ☐ No
DATE _____ TIME _____

1. Name of Facility

Contact Person/Position Title | ☐ Hospital ☐ Mental Health ☐ Nursing Home ☐ Rehabilitation

Address (Street or PO Box, City, State, Zip Code) | Telephone Number

2. Number of Cases and Number of Exposed at Each Location, Service, or Nursing Unit

	No. Cases Residents	No. Cases Employees	No. Exposed Residents	No. Exposed Employees	No. Cases Residents	No. Cases Employees	No. Exposed Residents	No. Exposed Employees	No. Cases Residents	No. Cases Employees	No. Exposed Residents	No. Exposed Employees
Medical Units	Unit				Unit				Unit			
Surgical Units	Unit				Unit				Unit			
Intensive Care Units	Adult/Type				Pediatric/Type				Newborn/Type			
Obstetrics	L & D				Post Partum				Newborn			
Rehabilitation	Unit				Unit				Unit			
Mental Health	Unit				Unit				Unit			
Long Term Care	Unit				Unit				Unit			

Illness/Disease	Date First Case Starting Outbreak	Date of Case Causing Outbreak to be Reported	Date of Last Case

3. Principal Symptoms/
Onset Dates

4. Microorganisms:
A. Specimen Source/
Collection Date | Findings:

B. Laboratory Name
and Address

5. Total Number of Cases	Residents	Employees	As of Date

6. Control Measure(s) Instituted